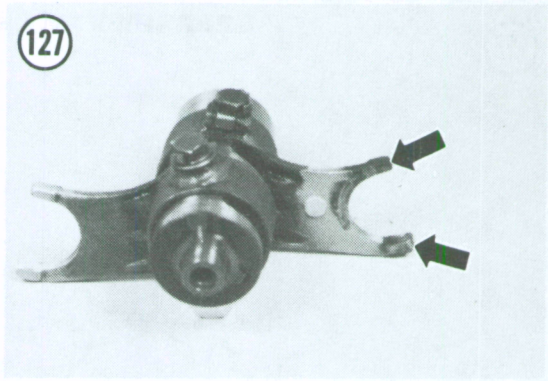
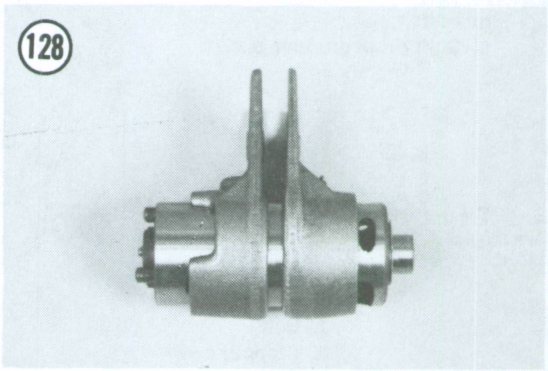
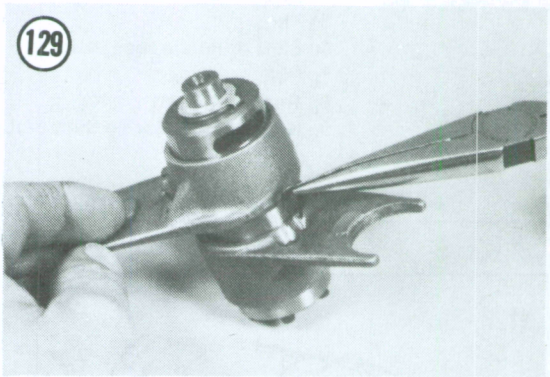
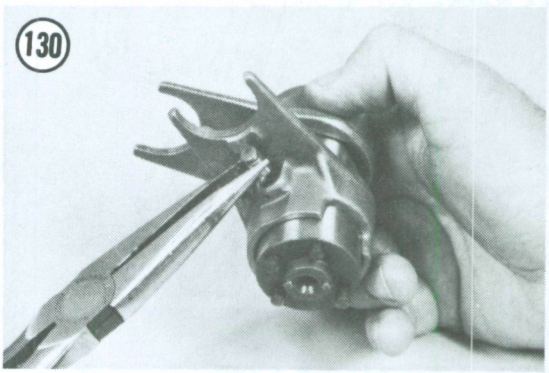
The shift fork fingers have become excessively worn and the fork must be replaced.

3. Inspect each shift fork for signs of wear or cracking. Check for bending and make sure each fork slides smoothly on the shift drum (**Figure 128**). Replace any worn or damaged forks.
4. Remove the clip (**Figure 129**) securing the guide pin in the shift fork.
5. Remove the guide pin (**Figure 130**) and slide the shift fork off of the shift drum.
6. Repeat Steps 4 and 5 for the other shift fork.
7. Measure the inside diameter of each shift fork (A, **Figure 131**) with an inside micrometer. Replace if worn to the service limit shown in **Table 2**.
8. Measure the width of the gearshift fork fingers with a micrometer (**Figure 132**). Replace any that are worn to the service limit shown in **Table 2**.
9. Measure the outside diameter of the shift drum (B, **Figure 131**) with a micrometer. Replace if worn to the service limit shown in **Table 3**.
10. Check the grooves in the shift drum (**Figure 133**) for wear or roughness. If any of the groove profiles have excessive wear or damage, replace the shift drum.
11. On models so equipped, inspect the neutral switch rotor on the end of the shift drum. If damaged, remove it and install a new one. Make sure the locating tang on the rotor is installed into the hole in the shift drum (C, **Figure 131**).
12. Apply a light coat of assembly oil to the shift drum and the inside bores of the shift forks prior to installation.
13. Be sure to install the shift forks correctly onto the shift drum; refer to marks made during disassembly.







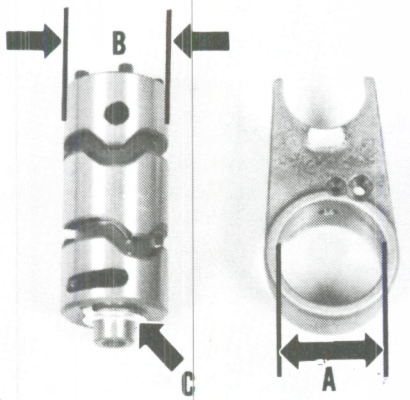


SUBTRANSMISSION

The ATC90, ATC110 and ATC125M have a dual-range subtransmission that is equipped with 2 reduction gears. On the ATC90, the unit is called "Posi-Torque." The unit is driven by the countershaft of the main transmission. It offers 2 different riding ranges or ratios—a low and a high range. Shifting is accomplished by moving a small lever on the subtransmission cover.

The dual-range subtransmission used on all models is basically the same. Where differences occur they are noted. The dual-range subtransmission is shown in the following illustrations:

a. ATC90—**Figure 134**.
b. ATC110—**Figure 135**.
c. ATC125M—**Figure 136**.



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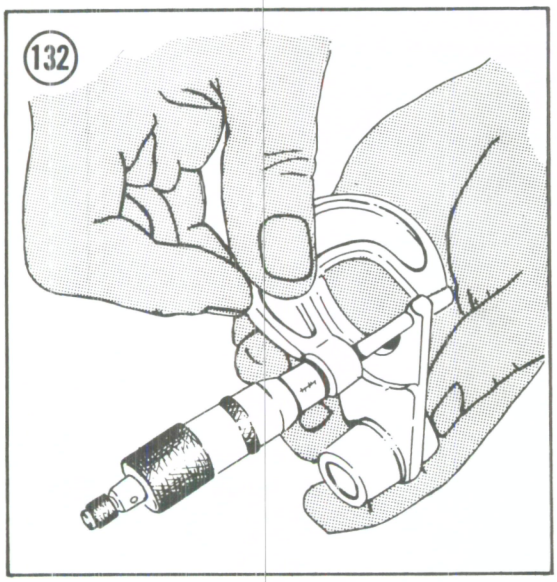

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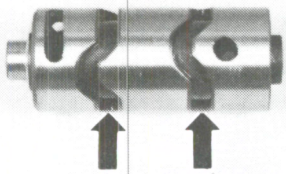

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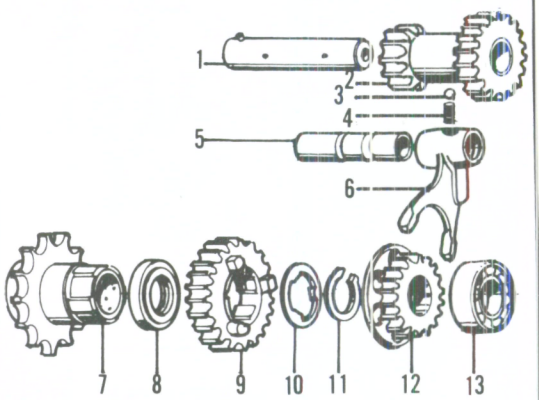
134

SUBTRANSMISSION ASSEMBLY (90 CC)



1. Idler gear shaft
2. Idler gear
3. Ball detent
4. Spring
5. Shift fork shaft
6. Shift fork
7. Drive sprocket
8. Oil seal
9. High-speed gear
10. Splined washer
11. Circlip
12. Low-speed gear
13. Bearing

Removal/Disassembly

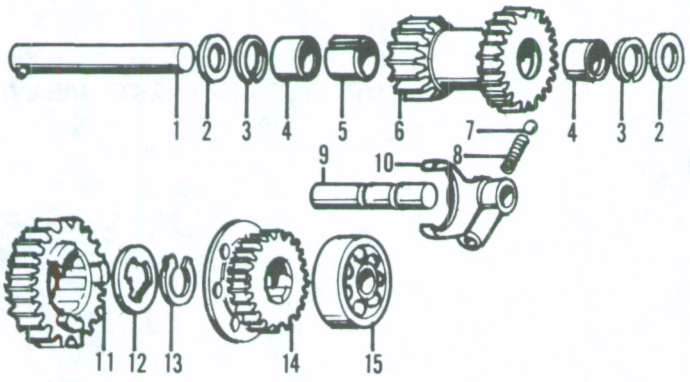
NOTE

This procedure is shown with the recoil starter assembly and the drive chain cover removed. It is not necessary to remove either for this procedure.

1. Place the ATC on level ground and set the parking brake.
2. Remove the seat/rear fender assembly.
3. Drain the engine oil as described in Chapter Three.

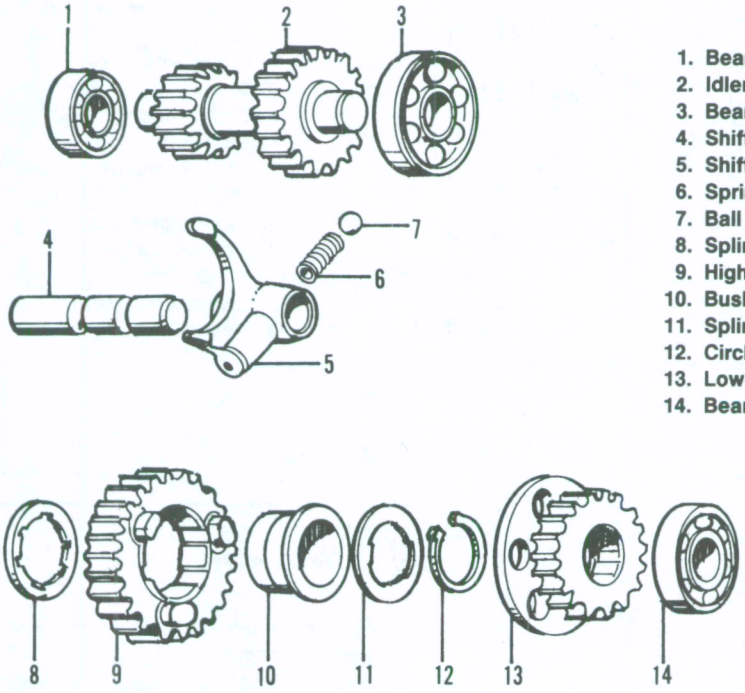
5

(135) SUBTRANSMISSION ASSEMBLY (110 CC)

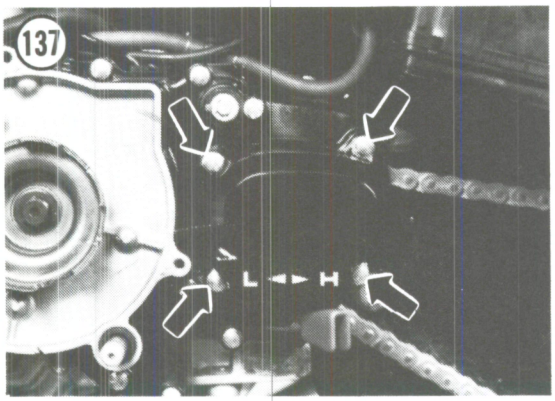


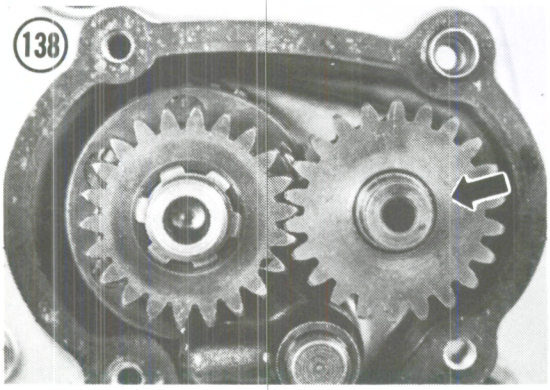
1. Idler gear shaft
2. Washer
3. Circlip
4. Needle bearing
5. Collar
6. Idler gear
7. Ball detent
8. Spring
9. Shift fork shaft
10. Shift fork
11. High-speed gear
12. Splined washer
13. Circlip
14. Low-speed gear
15. Bearing

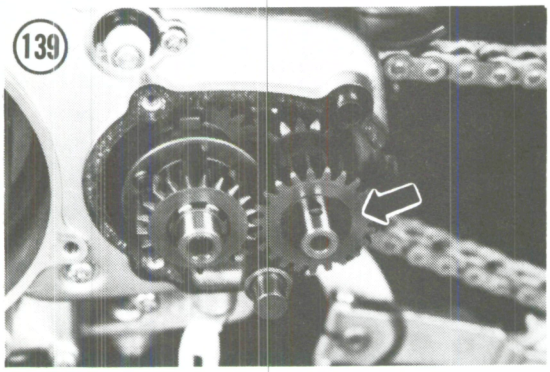
(136) SUBTRANSMISSION ASSEMBLY (125 CC)

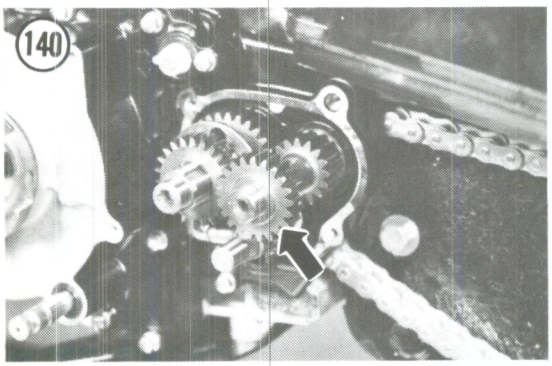


1. Bearing
2. Idler gear
3. Bearing
4. Shift fork shaft
5. Shift fork
6. Spring
7. Ball detent
8. Splined washer
9. High-speed gear
10. Bushing
11. Splined washer
12. Circlip
13. Low-speed gear
14. Bearing









4. Remove the screws (**Figure 137**) securing the subtransmission cover and remove the cover.

5A. On 90 cc models, move the shift lever to LOW and remove the idler gear assembly (**Figure 138**).

5B. On 110 cc models, slide off the idler drive gear washer, idler gear, idler gear shaft and washer (**Figure 139**).

NOTE

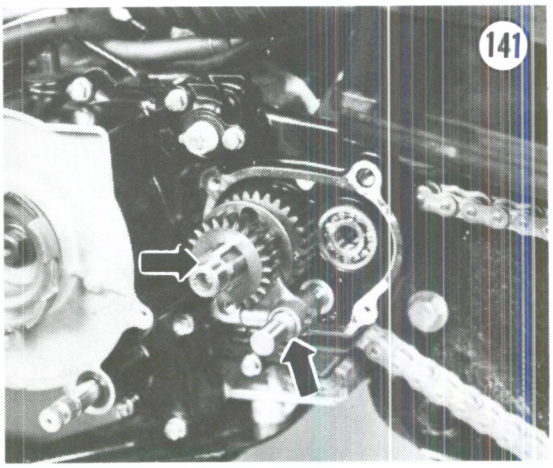
On 110 cc models, don't lose the dowel pin on the inside end of the idler gear shaft.

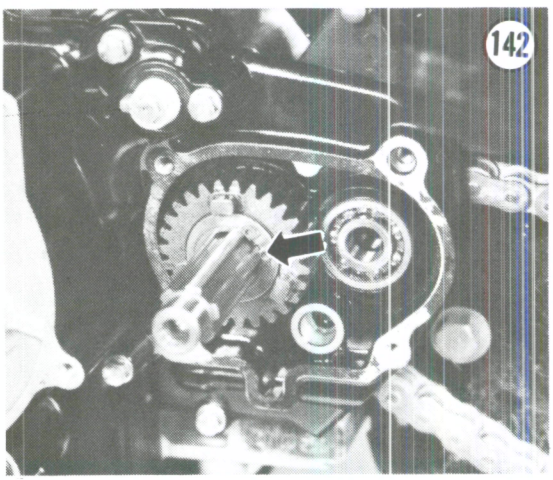
5C. On 125 cc models, slide off the idler drive gear assembly (**Figure 140**).

6. Withdraw the shift fork, the shift fork shaft and the low speed gear as an assembly (**Figure 141**).

7. Remove the circlip (**Figure 142**) securing the high speed gear.

8A. On 90 cc models, slide off the high speed gear splined washer and the high speed gear.





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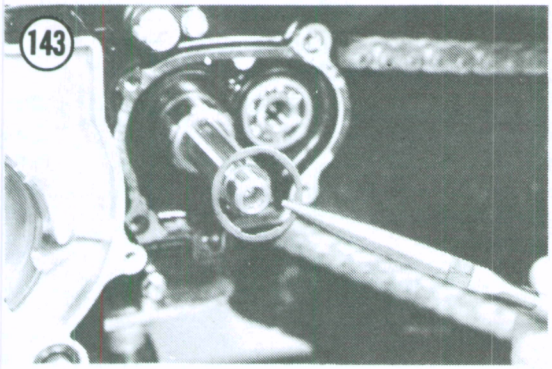
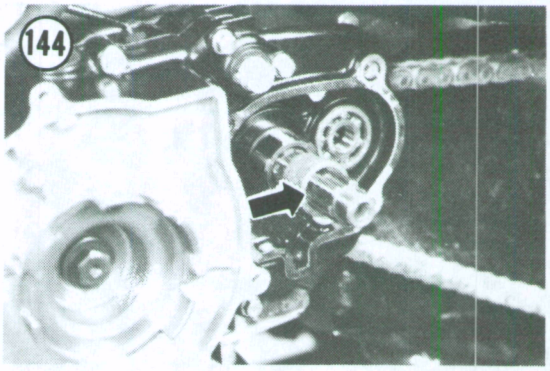




8B. On 110-125 cc models, slide off the high speed gear splined washer, the drive sprocket bushing and the high speed gear.
9. On 125 cc models, slide off the splined thrust washer (**Figure 143**) from the transmission countershaft.
10. If necessary, remove the drive sprocket bushing (**Figure 144**).

Inspection

1. Check each gear for excessive wear, burrs, pitting or chipped or missing teeth.

NOTE

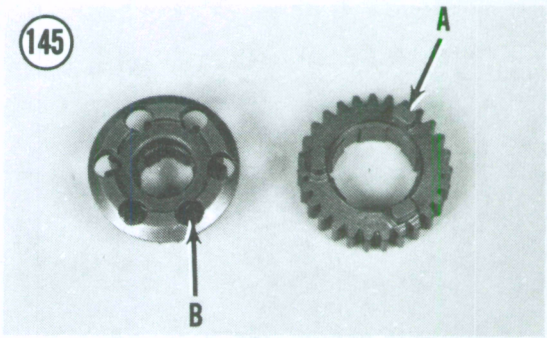
Defective gears should be replaced. It is a good idea to replace the mating gear even though it may not show as much wear or damage.

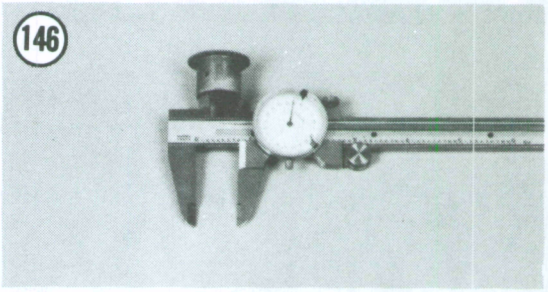
2. Make sure the low gear moves smoothly on the main transmission's countershaft.
3. Check the engagement lugs on the gear (A, **Figure 145**). If worn or damaged the gear should be replaced.
4. Check the engagement lug receptacles in the low gear (B, **Figure 145**). If worn or damaged the gear must be replaced.
5. On 90-110 cc models, make sure the idler gear turns smoothly on the idler gear shaft. It must rotate smoothly with no signs of wear or damage.
6. On 110 cc models, measure the inside diameter (**Figure 146**) and the outside diameter (**Figure 147**) of the drive sprocket bushing with a micrometer or a vernier caliper. Replace if worn to the service limits listed in **Table 4**.

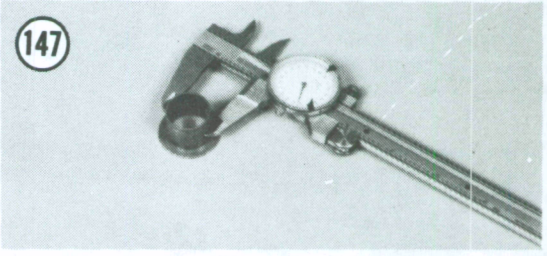
NOTE

90 cc models are also equipped with a drive sprocket bushing but Honda does not provide specifications.

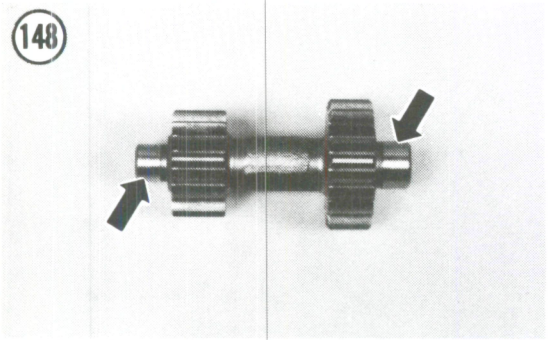
7. On 110 cc models, perform the following:
   a. Check the needle bearings within each end of the idler gear.

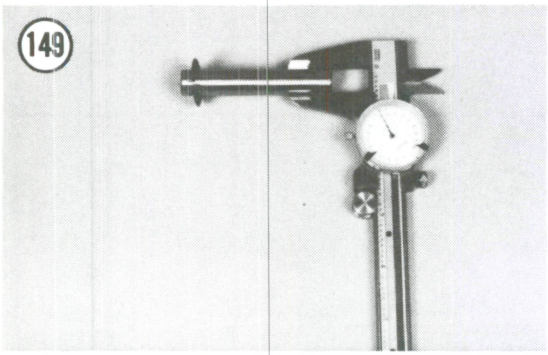


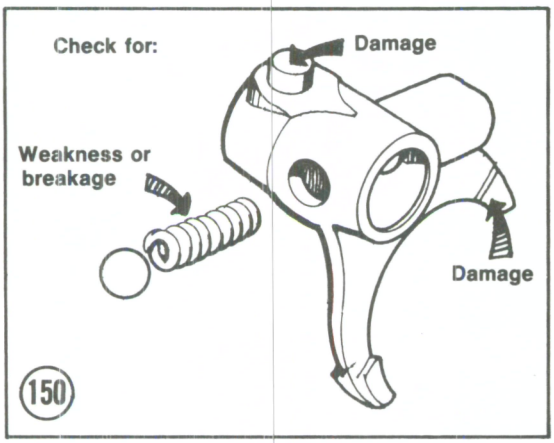


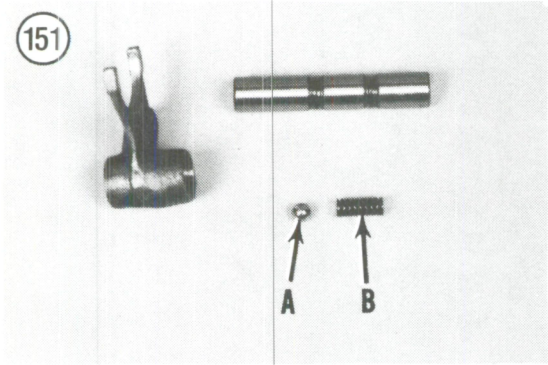


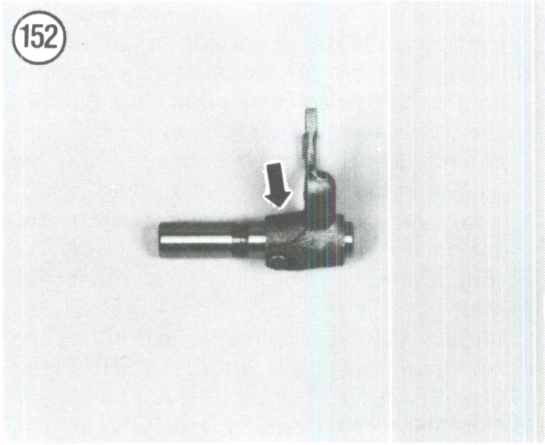
   b. Rotate each bearing with your finger. They should rotate smoothly with no signs of wear or damage.
   c. To replace, remove the snap ring in each end of the idler gear and slide out each bearing.
   d. Replace the bearing(s) and install a new snap ring(s).











8. On 125 cc models, inspect both ends of the idler gear assembly (**Figure 148**) where they ride on the bearings. Check for wear or damage; replace the assembly if necessary.
9. Measure the outside diameter of the shift fork shaft with a micrometer or a vernier caliper (**Figure 149**). Replace if worn to the service limit dimensions listed in **Table 4**.
10. Move the shift fork back and forth on the shaft and make sure the ball detent locks the shift fork in position in each groove in the shaft. The shift fork must be held tightly in place when the ball detent moves into the groove.

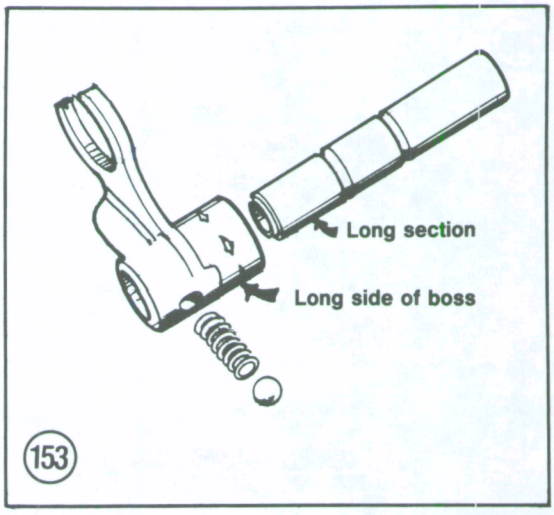
NOTE

In the next step do not lose the small ball detent and spring located within the shift fork.

11. Hold the shift fork/shaft assembly over and down close to a work bench. Slide the shift fork off of either end of the shift fork shaft. Catch the small ball detent and spring that will come out of the recess in the shift fork.
12. Check the shift fork (**Figure 150**) for signs of wear or cracking. Check for bending and make sure the shift fork slides smoothly on the shift fork shaft. Replace as necessary.
13. Check the ball detent (A, **Figure 151**) for wear or distortion; replace as necessary.
14. Check the ball detent spring (B, **Figure 151**) for sagging or breakage; replace as necessary.
15. Reassemble the shift fork onto the shaft as follows:
    a. Hold the shift fork shaft so the end with 2 grooves is on the left-hand side with the long section toward the right-hand side.
    b. Partially install the shift fork (long side of the boss on first) (**Figure 152**) onto the left-hand end of the shaft (**Figure 153**).

c. Through the hole in the shift fork, insert the spring and the ball detent into the shift fork.
d. Using a small-bladed screwdriver, push down on the ball detent and push the shift fork completely onto the shaft. Push the shift fork on until the ball detent indexes into one of the grooves in the shaft.
e. Move the shift fork back and forth on the shaft and make sure the ball detent locks the shift fork in position in each groove in the shaft.

16. Inspect the shaft support bearing in the subtransmission cover. On 90-110 cc models, refer to **Figure 154**. On 125 cc models, refer to **Figure 155** and **Figure 156**. Check for roughness, pitting, galling and play by rotating it slowly with your fingers. It should rotate smoothly. If the bearing(s) require replacing, refer to *Bearing Replacement* in this chapter.



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Bearing Replacement

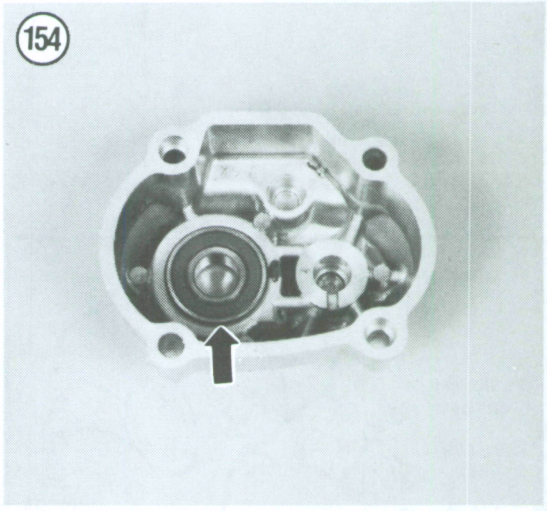
1A. On 90-110 cc models, if bearing replacement is necessary, turn the case with the open side down and tap it on a piece of soft wood. The bearing should fall out. Install the bearing with the sealed side facing out as shown in **Figure 154**.

1B. On 125 cc models, if bearing replacement is necessary perform the following:

a. Remove each bearing from the cover with Honda bearing remover (part No. 07936-KC10000) and remover weight (part No. 07936-3710200 or 07741-0010201).
b. Install each bearing with Honda bearing driver (part No. 07749-0010000), 32×35 mm attachment (part No. 07746-0010100) and 15 mm pilot (part No. 07746-0040300).

2. On 125 cc models, there is an additional bearing located in the left-hand crankcase spacer (**Figure 155**). If replacement is necessary, perform the following:

a. Remove the left-hand crankcase cover and spacer as described in Chapter Four.
b. Remove the bearing from the crankcase cover with Honda 12 mm bearing remover (part No. 07936-1660100) and remover weight (part No. 07936-3710200 or 07741-0010201).
c. Install the bearing with Honda bearing driver (part No. 07749-0010000), 32×35 mm attachment (part No. 07746-0010100) and 12 mm pilot (part No. 07746-0040200).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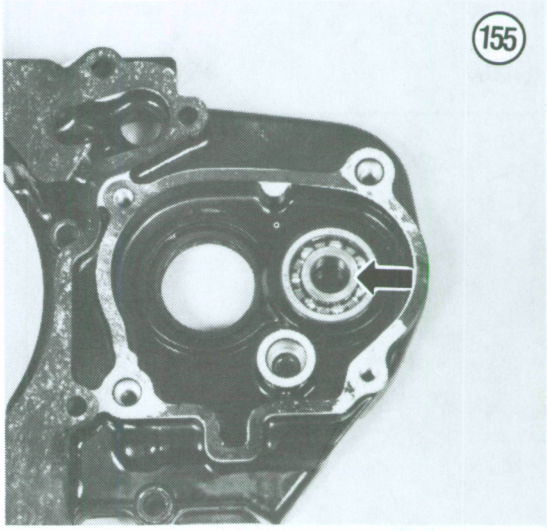
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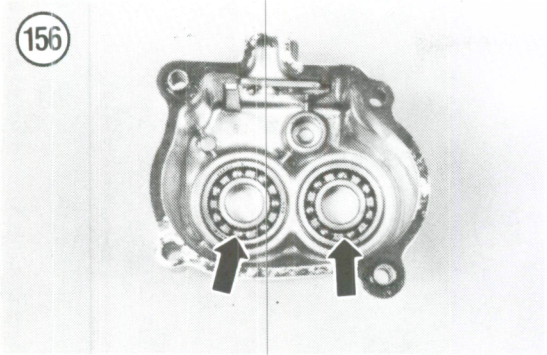
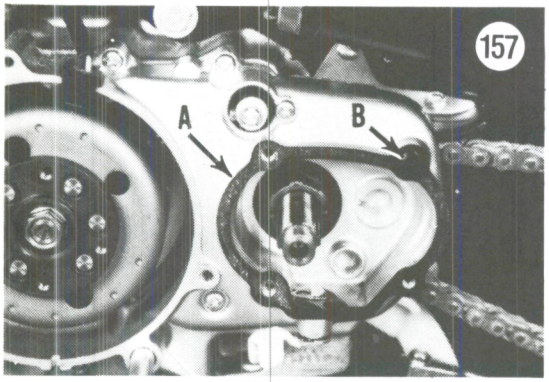
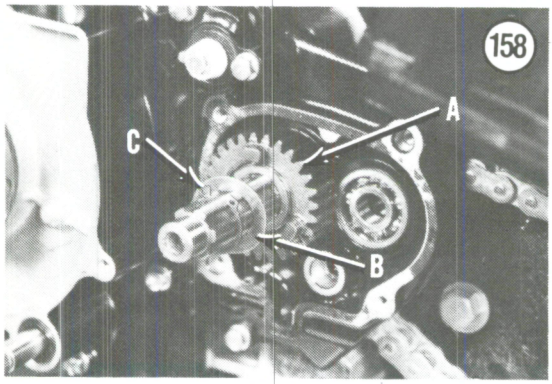
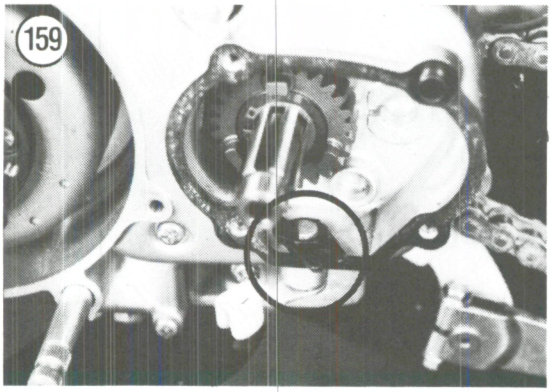
Assembly/Installation

1. Install a new gasket (A, **Figure 157**).
2. Make sure the locating dowel (B, **Figure 157**) is in place.

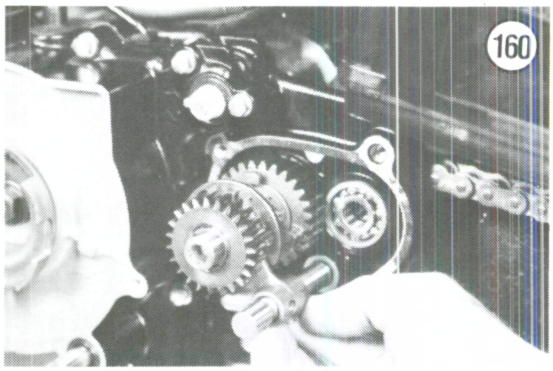


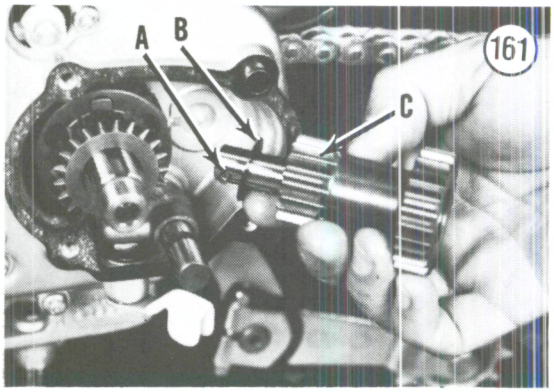




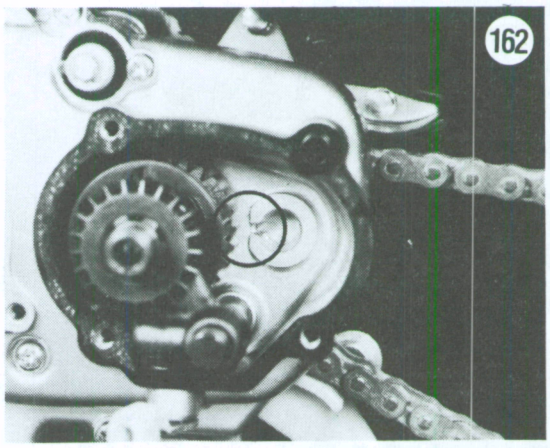


3. If removed, install the drive sprocket bushing (**Figure 144**).
4. On 125 cc models, install the splined thrust washer (**Figure 143**) onto the transmission countershaft.
5A. On 90 cc models, install the high speed gear and splined washer.
5B. On 110-125 cc models, install the high speed gear (A, **Figure 158**) and the splined washer (B, **Figure 158**).
6. Install the circlip (C, **Figure 158**). Make sure it seats correctly in the groove in the main transmission countershaft.
7. Position the shift lever plate as shown in **Figure 159**.
8. Install the shift fork shaft, shift fork and low speed gear as an assembly (**Figure 160**). Index the dowel in the shift fork into the groove in the shift lever plate.
9. On 110 cc models, make sure the dowel pin (A, **Figure 161**) in place in the idler gear shaft and install the washer (B, **Figure 161**).
10. Slide on the idler gear with the smaller diameter gear end on first (C, **Figure 161**).
11. On 110 cc models, align the dowel pin (A, **Figure 161**) with the locating groove (**Figure 162**) in the left-hand crankcase cover.



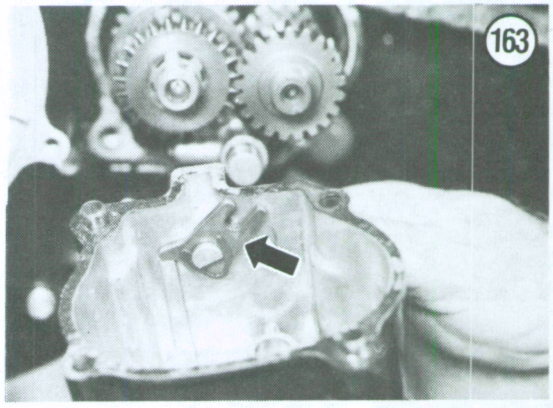


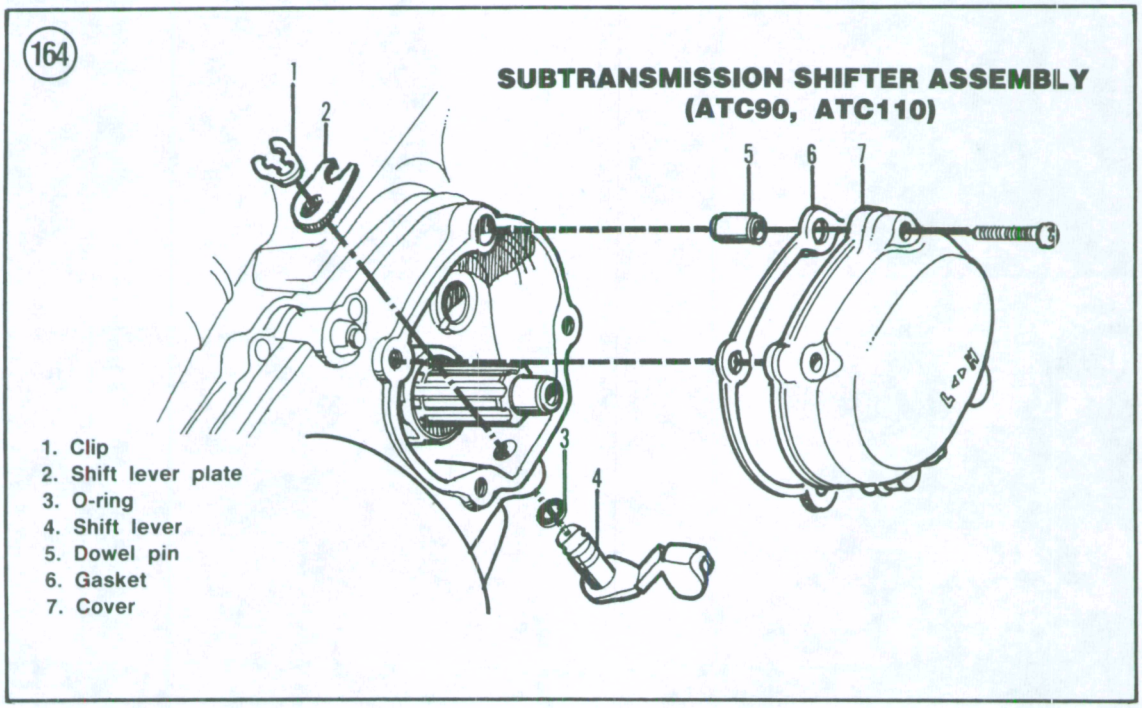
12. Install the idler gear assembly and push it on until it seats completely (**Figure 140**).
13. On 110 cc models, install the washer on the idler gear shaft (**Figure 139**).
14. Position the shift lever on the cover as shown in **Figure 163** so that it will engage with the dowel pin on the shift fork. As you push the cover into place, the shift lever will move from one gear selection to the other. This is okay; it means that the lever is properly engaged with the shift drum dowel pin.
15. Install the subtransmission cover and tighten the screws securely.
16. Refill the engine with the recommended type and quantity of engine oil; refer to Chapter Three.



Shifter Mechanism
Removal/Inspection/Installation

Refer to **Figure 164** (90-110 cc) or **Figure 165** (125 cc) for this procedure.
1. Remove all subtransmission components as described in this chapter.
2. Remove the clip and the shift lever plate.
3. Slide the shift lever out of the crankcase cover.
4. Check the O-ring on the shift lever for wear or damage. Replace as necessary.
5. Install by reversing these removal steps, noting the following.
6. Be sure to install the clip onto the shift lever as shown in **Figure 166**.





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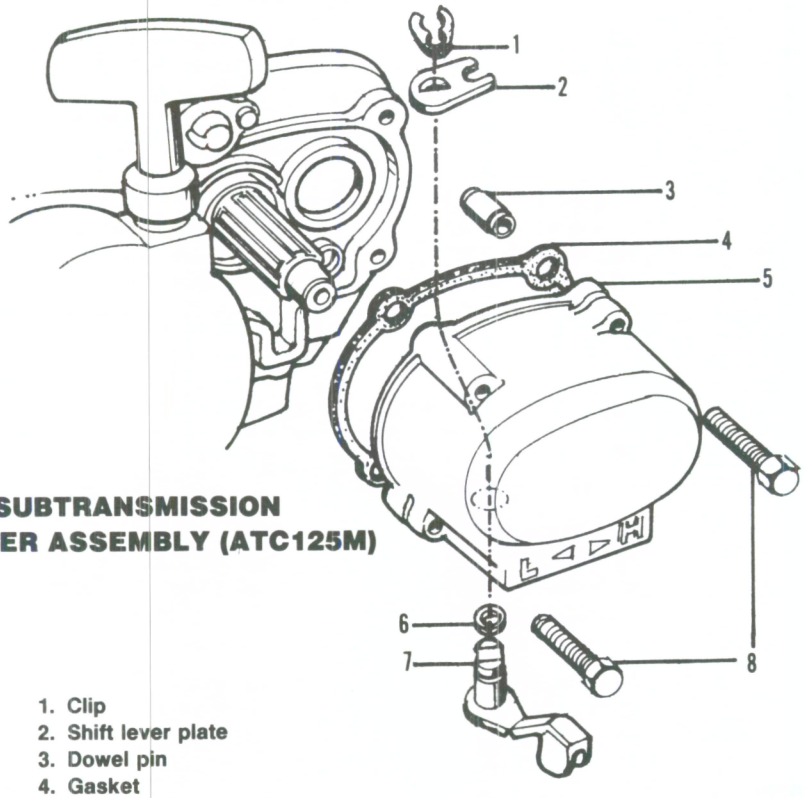

SUBTRANSMISSION SHIFTER ASSEMBLY (ATC125M)

1. Clip
2. Shift lever plate
3. Dowel pin
4. Gasket
5. Cover
6. O-ring
7. Shift lever
8. Bolt

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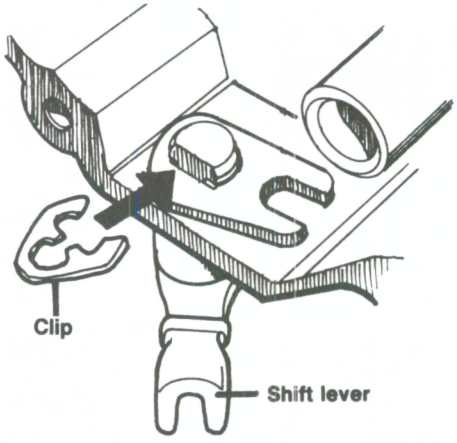

Table 1 CENTRIFUGAL CLUTCH SPECIFICATIONS

Item	Standard	Wear limit
Friction disc thickness		
ATC70	3.5 mm (0.136 in.)	3.15 mm (0.124 in.)
ATC90	2.8-2.9 mm (0.110-0.114 in.)	2.4 mm (0.094 in.)
ATC110, ATC125M	2.65-2.75 mm (0.104-0.108 in.)	2.5 mm (0.098 in.)
Clutch plate and disc warpage (all models)	–	0.20 mm (0.008 in.)
Clutch springs free length		
ATC70	20.0 mm (0.787 in.)	19.0 mm (0.748 in.)
ATC90	27.0 mm (1.063 in.)	26.0 mm (1.023 in.)
ATC110	24.5 mm (0.965 in.)	23.5 mm (0.925 in.)
ATC125	21.1 mm (0.83 in.)	20.2 mm (0.80 in.)

Table 2 SHIFT FORK AND SHAFT SPECIFICATIONS

Item	Specifications	Wear limit
Shift fork ID		
ATC70	34.0-34.025 mm (1.338-1.339 in.)	34.2 mm (1.347 in.)
ATC90, ATC110, ATC125M	42.0-42.025 mm (1.6535-1.6545 in.)	42.1 mm (1.657 in.)
Shift drum OD		
ATC70	33.95-33.98 mm (1.336-1.337 in.)	33.9 mm (1.335 in.)
ATC90, ATC110, ATC125M	41.95-41.975 mm (1.6516-1.6526 in.)	41.8 mm (1.645 in.)
Shift fork finger thickness		
ATC70		
Left shift fork	4.50-5.30 mm (0.177-0.209 in.)	4.3 mm (0.169 in.)
Right shift fork	5.50-6.30 mm (0.217-0.248 in.)	5.3 mm (0.209 in.)
ATC90, ATC110, ATC125M	5.96-6.04 mm (0.2346-0.2378 in.)	5.70 mm (0.2244 in.)

Table 3 TRANSMISSION SPECIFICATIONS (1981-ON ATC110 AND ATC125M)*

Item	Standard	Service limit
Transmission gears ID		
Main shaft		
2nd gear	18.000-18.018 mm (0.7087-0.7094 in.)	18.08 mm (0.712 in.)
4th gear	20.000-20.0212 mm (0.7874-0.7882 in.)	20.10 mm (0.791 in.)
Countershaft		
1st gear, 3rd gear	14.000-14.027 mm (0.5512-0.5522 in.)	14.10 mm (0.555 in.)

* Honda provides service information for this transmission only.

Table 4 SUBTRANSMISSION SPECIFICATIONS*

Item	Standard	Service limit
	ATC90	
Idler gear ID	13.000-13.018 mm (0.5200-0.5207 in.)	13.10 mm (0.5157 in.)
Idler gear shaft OD	12.966-12.984 mm (0.5200-0.5207 in.)	12.85 mm (0.5140 in.)
	ATC110	
Idler gear shaft OD	13.000-13.011 mm (0.5118-0.5122 in.)	12.95 mm (0.510 in.)

* Honda does not provide service specifications for the ATC125M.